

REMARKS/ARGUMENTS

Applicant's attorney thanks Examiner Deb for his assistance during telephone interviews regarding how to handle the objection to the specification with regard to pages 29-52 as originally filed. As a result of those interviews and review of pages 29-52, these pages have been deleted from the present application and a reference to the three part paper making up those pages has been inserted into the specification.

Applicant hereby confirms election of Group I claims 62-88, 104-121 and 123-128 for prosecution in the present application. Group II claims 89-103 and 122 have been canceled without prejudice to pursuing these claims in a division of the present application.

The specification has been amended to correct a minor typographical error, to place it in compliance with 37 C.F.R. §1.77(b), and to cancel pages 29-52. In place of pages 29-52, the specification has been amended to refer to a paper reflecting the content of these pages which has been published by the inventor of the present application.

An Information Disclosure Statement is being filed herewith together with the fee set forth in §1.17(p).

Claims 62, 121 and 123 have been amended to overcome rejections of these claims under 35 U.S.C. §112, second paragraph. More particularly, the words "such as Apparent Power or Power Factor" have been deleted from each of these claims. During review of the present application for preparation of this amendment, similar wording was noted in claims 104 and 113. Accordingly, this wording was also deleted from claims 104 and 113. In view of these amendments, withdrawal of the rejections under

§112, second paragraph, is respectfully requested.

Also, clarifying amendments have been made to independent claims 62, 104, 111, 113 and 123. More specifically, the calculated magnitudes used to determine the value of the electrical power parameter are determined by RMS averaging.

The rejection of claims 62-66, 68, 69 and 87 under 35 U.S.C. §102(b) as being anticipated by Arseneau et al. (US 4,937,520 - Arseneau herein) is respectfully traversed. Arseneau discloses an instrument for determining, under actual field conditions, which type of VA demand meters are most appropriate for a particular power consumer. The type of electrical load that a consumer places on an electrical supply system can introduce harmonics and phase distortion in the system resulting in VA meters producing incorrect readings.

These VA meters are intended to measure the true apparent power S which is defined as $S = V_{rms} * I_{rms}$; however, VA meters are generally designed to operate according to one of two approximation formulas: (first approximation formula) $S' = V_{rect} * I_{rect} * (1.11)^2$ - equation (2) in Arseneau, where V_{rect} and I_{rect} are the average of the rectified values of the voltage and current waveforms of the power supply; and, (second approximation formula) $S'' = \sqrt{P^2 + Q^2}$ - equation (3) in Arseneau, where P is the active power and Q is the reactive power. The instrument contains circuitry to measure the RMS values of the voltage and current waveforms from which the true apparent power S can be obtained as well as circuitry to determine the values S' and S'' according to the two approximation formulas.

By taking $((S^2 - S')/S) * 100$, an error signal e_1 is obtained which indicates the type of error that could be expected from a VA meter operating according to approximation formula (1), and by taking $((S^2 - S'')/S) * 100$, an error signal e_2 is

obtained which indicates the type of error that could be expected from a VA meter operating according to approximation formula (2). As a result, it is possible to determine which type of VA meter is most appropriate for a particle consumer.

Claim 62 of the present application, as currently amended, recites:

A method of measuring the value of an electrical power parameter of an electrical power signal, the method comprising:

- calculating a first instantaneous power component as the product of an instantaneous voltage signal of the electrical power signal and an instantaneous current signal of the electrical power signal;

- carrying out a relative phase shift between the instantaneous voltage signal and the instantaneous current signal;

- calculating a second instantaneous power component as the product of the relatively phase-shifted instantaneous voltage and instantaneous current signals;

- RMS averaging each of the first and second power components to determine their respective magnitudes; and

- using both of the calculated magnitudes, as determined from the RMS averaging step, to determine the value of the electrical power parameter.

Arseneau does not disclose or suggest the step of RMS averaging each of the first and second instantaneous power components to determine their respective magnitudes. While Arseneau obtains instantaneous power components (P – Active Power and Q – Reactive Power) as the outputs of the circuits 7 and 11 (see Figure 2) and these are average values as indicated by Arseneau at line 20 of column 1 where short term averaging, e.g., 15 minutes, is described, there is no RMS averaging of the first and second power components, P and Q , as required by claim 62. Rather, Arseneau squares the values of P and Q at circuits 12 and 13, respectively, sums the squared values at circuit 14, and takes the square root of the summed squared values at circuit 15 to obtain the apparent power using the second approximation formula noted above, S ". In Arseneau, the only RMS values (the RMS value of the voltage, V_{rms} , and the RMS value of the current, I_{rms}) are obtained from circuits 3 and 4, and

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these RMS values are processed by the multiplication of V_{rms} by I_{rms} to obtain the apparent power S , see the above formula.

A fortiori, since each of the first and second power components, P and Q , are not RMS averaged in Arseneau, the last step in claim 62 of using both of the calculated magnitudes, as determined by the RMS averaging step, to determine the value of the electrical power parameter cannot be shown.

In Arseneau, the true apparent power S and the two approximations S' and S'' of the apparent power, which correspond to two common forms of VA meters, are determined. The true apparent power S is compared to both of the two approximations S' and S'' to determine which type of VA meter should be used for a particular consumer. Thus, Arseneau recognizes that the apparent power approximations S' and S'' differ from the true apparent power noting, for example, at column 2, lines 13 to 15, that the measurement S'' *'is not correct for distorted waveform conditions'* [emphasis added]. Rather than determine which type of meter should be used to best approximate the power drawn by a consumer, the present invention aims to solve the inaccuracy problem by using an arrangement for power measurement that is completely different from anything disclosed in Arseneau and that arrangement for power measurement is recited in the claims of the application as noted above. Accordingly, it is respectfully submitted that claim 62 and the claims that depend directly or ultimately therefrom, claims 63-88 and 119-121 are in condition for allowance which is requested.

The rejection of claims 67, 79-81, 120 and 121 under 35 U.S.C. §103(a) as being unpatentable over Arseneau taken alone is respectfully traversed. It is noted that all these claims depend directly or ultimately from claim 62 and should be considered to be in condition for allowance in view of the above remarks made relative to claim 62.

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Accordingly, it is respectfully submitted that claims 67, 79-81, 120 and 121 are in condition for allowance which is requested.

The rejection of claims 70-72, 88, 104-107, 110, 112 and 119 under 35 U.S.C. §103(a) as being unpatentable over Arseneau in view of Hoffman et al. (US 5,673,196 - Hoffman herein) is respectfully traversed. It is initially noted that claims 70-72, 88 and 119 depend directly or ultimately from claim 62 and should be considered to be in condition for allowance in view of the above remarks made relative to claim 62.

Currently amended claim 104 recites limitations similar to those of claim 62. More particularly, in addition to other steps, claim 104 recites the steps of "RMS averaging each of the first and second instantaneous power components to determine their respective magnitudes; and using the calculated magnitudes determined from the RMS averaging step, to determine the value of the electrical power parameter." Since this is the case, the same remarks made relative to claim 62 apply equally to claim 104. Accordingly, it is respectfully submitted that claim 104 and the claims that depend directly or ultimately therefrom, claims 105-112, are in condition for allowance which is requested.

The rejection of claims 82-86, 113-118 and 123-126 under 35 U.S.C. §103(a) as being unpatentable over Arseneau in view of Shultz (US 3,697,872) is respectfully traversed. It is initially noted that claims 82-86 depend ultimately from claim 62 and should be considered to be in condition for allowance in view of the above remarks made relative to claim 62.

Currently amended claim 113 recites limitations similar to those of claim 62. More particularly, in addition to other steps, claim 113 recites the steps of "RMS averaging each of the first and second instantaneous power components to determine

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their respective magnitudes; and using the calculated magnitudes determined from the RMS averaging step, to determine the value of the electrical power parameter.” Since this is the case, the same remarks made relative to claim 62 apply equally to claim 113. Accordingly, it is respectfully submitted that claim 113 and the claims that depend directly or ultimately therefrom, claims 114-118, are in condition for allowance which is requested.

Currently amended claim 123 recites limitations similar to those of claim 62. More particularly, in addition to other steps, claim 123 recites “means for RMS averaging each of the first and second power components to determine their respective magnitudes; and means for using the calculated magnitudes determined by the RMS averaging means to determine the value of the electrical power parameter.” Since this is the case, the same remarks made relative to claim 62 apply equally to claim 123. Accordingly, it is respectfully submitted that claim 123 and the claims that depend directly therefrom, claims 124-128, are in condition for allowance which is requested.

The rejection of claims 73-78, 108, 109 and 111 under 35 U.S.C. §103(a) as being unpatentable over Arseneau and Hoffman in view of Shilo (US 5,072,187) is respectfully traversed. It is initially noted that claims 73-78 depend ultimately from claim 62 and should be considered to be in condition for allowance in view of the above remarks made relative to claim 62. Similarly, claims 108, 109 and 111 depend directly or ultimately from claim 104 and should be considered to be in condition for allowance in view of the above remarks made relative to claim 104 and 62. Accordingly, it is respectfully submitted that claims 73-78, 108, 109 and 111 are in condition for allowance which is requested.

The rejection of claims 127 and 128 under 35 U.S.C. §103(a) as being unpatentable over Arseneau in view of Shultz and Hoffman is respectfully traversed. It

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is noted that claims 127 and 128 depend directly from claim 123 and should be considered to be in condition for allowance in view of the above remarks made relative to claim 123 and claim 62. Accordingly, it is respectfully submitted that claims 127 and 128 are in condition for allowance which is requested.

The prior art made of record in paragraph 16 of the identified Office action as being considered pertinent to the disclosure of the present application has been reviewed. Since this art was not relied on in the action, it will not be addressed herein.

In view of the foregoing amendments and remarks, it is respectfully submitted that claims 62-88, 104-121 and 123-128 now pending in the present application are in condition for allowance. Accordingly, applicants request reconsideration of the application and allowance of all claims.

If the present amendment raises any questions or the Examiner believes that an interview would facilitate prosecution of the present application, he is respectfully requested to contact the undersigned attorney.

Respectfully submitted,
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